

**PADRÃO DE RESPOSTAS**

**QUESTÃO 01**

(A) rendimento ( $\eta$ ) =  $\frac{P_u}{P_m} = 0,5$

$$P_u = \frac{W}{t} = \frac{mgh}{t} = \frac{500 \times 10 \times 20}{100} = 10^3 \text{ W}$$

$$P_m = \frac{P_u}{\eta} = 2 \times 10^3 \text{ W} = \mathbf{2,67 \text{ HP}}$$

(B)  $m = 500 \text{ Kg}$

$$P = \frac{mg}{A} = \frac{500 \times 10}{2} = \mathbf{2,5 \cdot 10^3 \text{ N/m}^2}$$

**QUESTÃO 02**

(A)  $Q = Q_1 + Q_2 = mc\Delta T + mL = \mathbf{10 \text{ kcal}}$

(B)  $\frac{P_1 V_1}{T_1} = \frac{P_2 V_2}{T_2}$

$$T_1 = 273 - 3 = 270 \text{ K}$$

$$T_2 = 273 - 19 = 254 \text{ K}$$

$$V_1 = V_2 \Rightarrow P_2 = \frac{P_1 T_2}{T_1} = \frac{1 \times 254}{270} = \mathbf{0,94 \text{ atm}}$$

**QUESTÃO 03**

(A)  $Q = mc\Delta T$

$$P = 10^4 \frac{\text{cal}}{\text{min}}$$

$$t = \frac{mc\Delta T}{P} = \frac{200 \times 1 \times 50}{10^4} = \mathbf{1 \text{ min}}$$

(B)  $\lambda = \frac{c}{f} = \frac{3 \times 10^8}{2,45 \times 10^9} = \mathbf{0,12 \text{ m}}$

**QUESTÃO 04**

(A)  $P = h\mu g$

$$10^5 = h \cdot 10^3 \cdot 10$$

$$h = 10 \text{ m}$$

(B)  $Vazão = \frac{10}{1,0} = 10 \text{ l/min}$

**QUESTÃO 05**

(A)  $E = mgh$

$$E = 3 \times 10 \times 0,6 = 18 \text{ J}$$

(B)  $v_f^2 = v_0^2 + 2 \times a \times h$

$$v_f = \sqrt{2 \times 10 \times 0,6} = \sqrt{12} \text{ m/s}$$

**QUESTÃO 06**

(A)  $\lambda_{\text{cor}} = \frac{(535 + 610)}{2} = 572,5 \text{ nm}$

$$f = \frac{v}{\lambda}$$

$$f = \frac{3 \times 10^8}{572,5 \times 10^{-9}} = 5,24 \cdot 10^{14} \text{ Hz}$$

(B)  $1,6 \times 10^{-16} = \frac{1}{2} \times m_e \times v^2$

$$v = \sqrt{\frac{2 \times 1,6 \times 10^{-16}}{9,1 \times 10^{-31}}} = 1,88 \times 10^7 \text{ m/s}$$

$$F = evB = 3 \cdot 10^{-14} \text{ N}$$

**QUESTÃO 07**

(A)  $E = \frac{1}{2} V^2 C$

$$V = 1,5 + 1,5 = 3 \text{ V}$$

$$E_{\text{max}} = \frac{1}{2} \times 3^2 \times 15 \times 10^{-6} = 6,75 \cdot 10^{-5} \text{ J}$$

(B)  $I_{\text{max}} = \frac{3}{6} = 0,5 \text{ A}$

**QUESTÃO 08**

$$(A) F_{\text{cent}} = m \times a_{\text{cent}} = m \left( \frac{v^2}{R} \right) = m \times \omega^2 \times R$$

$$F_{\text{atrito}} = \mu \times N = \mu \times F_{\text{cent}}$$

$$F_{\text{atrito}} = m \times g$$

$$\omega = \sqrt{\frac{g}{\mu R}} = \sqrt{\frac{10}{0,5 \times 0,25}}$$

$$\omega = \mathbf{8,9 \text{ rad/s}}$$

$$(B) \omega = \omega_0 + \alpha t$$

$$3 \text{ rot/s} = 3 \times 2\pi \text{ rad/s}$$

$$3 \times 2\pi = 2 \times \Delta t$$

$$\Delta t = 3\pi \text{ s}$$

$$\Omega = \frac{1}{2} \times \alpha \times t^2 = \frac{1}{2} \times 2 \times (3\pi)^2 = 9\pi^2$$

$$n_{\text{rot}} = \frac{9\pi^2}{2\pi} = \mathbf{4,5p}$$

**QUESTÃO 09**

$$(A) \frac{d}{H} = \frac{x}{2x}$$

$$H = 2d = \mathbf{140 \text{ cm}}$$

$$(B) D = 2d - (d + d - 20 - 20) = \mathbf{40 \text{ cm}}$$

**QUESTÃO 10**

$$(A) 1.450 - 1.230 = 220 \text{ W} = 0,22 \text{ kW}$$

$$0,22 \times 10 = 2,2 \text{ kWh}$$

$$\text{economia} = 0,33 \times 2,2 = \mathbf{R\$ 0,73}$$

$$(B) \frac{1.450}{1.230} = \mathbf{1,18 \text{ vezes}}$$